Jerry Zhu

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EDUCATION

Stony Brook University   Stony Brook, NY
Bachelor of Science, Computer Science   *August 2022 - May 2026*
- **Cumulative GPA**: 3.54
- **Coursework**: Discrete Mathematics, Linear Algebra, Data Structures and Algorithms, Probability and Statistics
- **Extracurriculars**: Stony Brook Game Developers, Stony Brook Computing Society

TECHNICAL SKILLS

Languages: C++ / C, C#, GLSL, Java, Python, Lua
Skills & Technologies: OpenGL, Multithreaded Programming
Developer Tools: Git, GDB, Valgrind, RenderDoc
Game Engines: Unity, Godot

PROJECTS

CrankLang | *C++*   March 2023 - May 2023
- Designed a statically typed language supporting user-defined structures, enumerations, and multiple file modules with a handwritten recursive descent parser and compiler in C++.
- Compiles programs from a type-checked and statically analyzed abstract syntax tree (AST) into C++ code.
- Added a constant-folding optimization pass by preprocessing and substituting parts of the AST if any sub-expression was considered constant.

Tactical RPG - Legends | *C, SDL2, Emscripten*   June 2022 - September 2023
- Designed and implemented an initiative turn-based combat system through a queue with undo-able actions.
- Eliminated runtime memory allocations with a double-ended stack allocator divided into permanent allocations and level allocations backed by a fixed 16MB buffer.
- Developed a tiled software renderer with a multithreaded job system and SSE improving performance by 200%.
- Designed a save system with delta compression reducing the memory usage of the system and save-file size by omitting redundant or static data.
- Designed a Lisp-based scripting language with a custom parser to facilitate the development of game data such as items, dialogue, cutscenes, and entity data.

Action-Platformer - Ascension | *C, SDL2*   February 2022 - March 2022
- Implemented a custom platformer physics engine with support for slopes and fixed timestep updates to allow for more deterministic and stable simulation behavior.
- Developed a particle system with physical interactions with a spatial partitioning scheme to reduce the set of collisions for participating particles.
- Designed an in-game level editor with support for live level playtesting allowing for iterative level design.
- Implemented Hollow Knight inspired gameplay mechanics such as 'pogo-bouncing', wall jumping, and dashing.

2D Game Framework | *C, OpenGL, SDL2, Emscripten*   July 2021 - October 2021
- Coded a plugin system to allow game code to be swapped without recompiling the framework.
- Implemented a sprite batcher with a packed 16-bit integer vertex format reducing data size per sprite resulting in lower memory usage, and screen sprite culling.
- Built a configurable glyph cache supporting arbitrary text with a fixed memory footprint. The cache is a hashset that invalidates and regenerates the cache if there are hash collisions.

LEADERSHIP

Software Development Team Lead   February 2021 - September 2022
The Environment Project - Non-Profit Organization   *Queens, NY*
- Led the development of Recyclopedia, a wiki web application with a team of 4 using React, MongoDB, and Typescript
- Maintained and redesigned the organization's WordPress website which reached 10K visitors
- Authored the event page for the Flushing Meadows Corona Park clean-up which resulted in 111 participants
- Managed collaboration through GitHub pull requests, Trello, and pair-programming meetings on Zoom